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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,437	07/27/2001	Vivek B. Nadkarni	TRMB964	9713

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04/18/2003

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EXAMINER

LAU, TUNG S

ART UNIT

PAPER NUMBER

2863

DATE MAILED: 04/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/917,437

Applicant(s)

NADKARNI ET AL.

Examiner

Tung S Lau

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 February 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 10, 17, 2, 3, 4, 5, 11, 12, 13, 18 and 19 are rejected under 35

U.S.C. 102(b) as being anticipated by Van Steenwyk (U.S. Patent 4,461,088).

Regarding claim 1:

Van Steenwyk discloses a method for simultaneously determining respective scale factors or alignment angles of sensitive axes in a multi-axis accelerometer device for measuring acceleration, comprising the steps of a) mounting a multi-axis accelerometer device on a turntable in a first orientation (col. 1, lines 45-61), the turntable having a tilt angle with respect to a vertical axis defined by a local gravity vector (col. 1, lines 62-68); b) spinning a multi-axis accelerometer device around an axis of rotation at an angular velocity using the turn table such that the multi-axis accelerometer device experiences a time varying component of the local gravity vector (col. 5, lines 15-25); c) receiving respective outputs of the multiple axis as the multi-axis accelerometer device experiences the time varying component of the local gravity vector (fig. 3); d) repeating steps (a), (b) and (c) with the multi-axis accelerometer device mounted in a second orientation

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(fig. 7); and, e) repeating steps (a), (b) and (c) with the multi-axis accelerometer device mounted in a third orientation (fig. 9); and, f) determining respective scale factors or alignment angles of the multiple axes of the accelerometer device by combining the respective received outputs of the accelerometer device with predicted outputs of an ideal accelerometer (fig. 11), the predicted outputs based on the tilt angle of the turntable, the angular velocity of the ideal accelerometer, and the local gravity vector (fig. 11, col. 1, lines 45-68).

Regarding claim 10:

Van Steenwyk discloses a system for simultaneously determining respective scale factors or alignment angles of a multi-axis accelerometer device for measuring acceleration (abstract), comprising a turn table mechanism configured to mount an accelerometer device having multiple axis for calibration (col. 1, lines 45-61), the turntable having a tilt angle with respect to a vertical axis defined by a local gravity vector (col. 1, lines 13-27, lines 45-61), the turntable configured to spin the accelerometer device around an axis of rotation at an angular velocity such that the accelerometer device experiences time varying components of the local gravity vector; and a processor system coupled to receive respective outputs of the multiple sensitive axes of the accelerometer device (col. 1, lines 62-68), the processor system (col. 4, lines 13-18) configured to record the outputs of the accelerometer device as the device experiences the time varying components of the local gravity vector and to determine respective scale factors or alignment angles of the multiple axis of the accelerometer device by

combining the logged outputs of the accelerometer device with a predicted output of an ideal accelerometer (fig. 11, col. 5, lines 15-25) the predicted output based on the tilt angle of the turntable, the angular velocity of the ideal accelerometer and the local gravity vector (fig. 9-11).

Regarding claim 17:

Van Steenwyk discloses a method for simultaneously determining respective scale factors or alignment angles of sensitive axes in a multi-axis accelerometer device for measuring acceleration, comprising the steps of a) mounting a multi-axis accelerometer device on a turntable in a first orientation (fig. 8), the turntable having a tilt angle with respect to a vertical axis defined by a local gravity vector (col. 3, lines 53-68); b) spinning a multi-axis accelerometer device around an axis of rotation at an angular velocity using the turn table such that the multi-axis accelerometer device experiences a time varying component of the local gravity vector col. 5, lines 15-25); c) receiving respective outputs of the multiple axis as the multi-axis accelerometer device experiences the time varying component of the local gravity vector (col. 5, lines 40-68); d) determining respective scale factors or alignment angles of the 30 multiple axes of the accelerometer device by combining the respective received outputs of the accelerometer device with predicted outputs of an ideal accelerometer (fig. 11), the predicted outputs based on the tilt angle of the turntable, the angular velocity of the ideal accelerometer, and the local gravity vector (fig. 11).

Regarding claims 2, 3, 4, 5, 11, 12, 13, 18 and 19:

Van Steenwyk discloses a method for simultaneously determining respective scale factors or alignment angles of sensitive axes in a multi-axis accelerometer device for measuring acceleration including constant angular velocity (col. 4, lines 1-13); The accelerometer is oriented three orientation while recording data (col. 1, lines 45-60); The time varying components of the local gravity vector are equal to  $g \cdot \sin(x) \cdot \cos(y(t))$  and  $g \cdot \sin(x) \cdot \sin(y(t))$  (fig. 9-11), where  $x$  is the tilt angle,  $g$  is the acceleration due to gravity, and  $y$  is an angle subtended at the axis of rotation by the accelerometer and the component of gravity in the plane of rotation of the accelerometer (fig. 9-11); using low pass filter (col. 5, lines 40-49); multiple-axis accelerometer mounted in second and third position (col. 1, lines 45-68).

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

a. Claims 6-9 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Steenwyk (U.S. Patent 4,461,088) in view of Slater et al. (U.S. Patent 6,545,440).

Van Steenwyk discloses a method including the subject matter discussed above except the use of Fourier Transforms and analog to digital converter. Slater discloses the use of Fourier Transforms and analog to digital converter (col. 1, lines 30-33), in order to have a high accuracy precision measurement system (abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Van Steenwyk to have the use of Fourier Transforms and analog to digital converter taught by Slater in order to have a high accuracy precision measurement system (abstract).

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung S Lau whose telephone number is 703-305-3309. The examiner can normally be reached on M-F 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on 703-308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-5841 for regular communications and 703-308-5841 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

TC2800 RightFAX Telephone Numbers : TC2800 Official Before-Final RightFAX - (703) 872-9318, TC2800 Official After-Final RightFAX - (703) 872-9319

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TC2800 Customer Service RightFAX - (703) 872-9317

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**BRYAN BUI**  
**PRIMARY EXAMINER**

A handwritten signature in black ink, appearing to read 'Bryan Bui', is written below the printed name and title.